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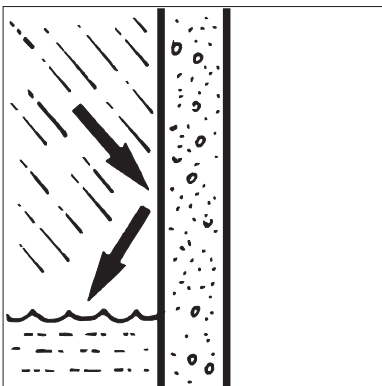
Product

• *THIS CERTIFICATE RELATES TO THE EVERDURE CALTITE SYSTEM, A TWO-COMPONENT SYSTEM INCORPORATING A HYDROPHOBIC AND A PORE-BLOCKING INGREDIENT TO PROVIDE WATERPROOF CONCRETE WITH ENHANCED DURABILITY AND IMPROVED PROTECTION AGAINST REINFORCEMENT CORROSION.*

• *The system comprises a water reducing superplasticiser and a separate component to provide hydrophobicity to the densified matrix together with a pore blocking ingredient.*

• *The system has no detrimental effects on the properties of the cured concrete.*

• *The system can provide waterproof concrete for basements, swimming pools, roofs, tunnels and other similar situations.*



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**Agrément
Certificate
No 93/2888**


Fourth issue*

EVERDURE CALTITE SYSTEM

Additif pour béton imperméable
Beimischung zur Beton Wasserdichtung


Regulations

1 The Building Regulations 2000 (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of waterproofing with the Building Regulations. In the opinion of the BBA, the Everdure Caltite System, if used in accordance with the provisions of this Certificate, will meet the relevant requirements.


Requirement:	C4	Resistance to weather and ground moisture
Comment:		The product meets this Requirement. See sections 8.2, 8.3 and 12.7 to 12.9 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is an acceptable material. See section 13 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

 In the opinion of the BBA, the Everdure Caltite System, if used in accordance with the provisions of this Certificate, can satisfy or contribute to satisfying the various Regulations and related Standards as listed below.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The product complies with this Standard. See section 13 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G2.6	Resistance to moisture from the ground
Comment:		The product can enable a floor to satisfy the requirements of this Standard. See sections 8.2 and 12.7 to 12.9 of this Certificate.
Standard:	G3.1	Resistance to precipitation
Comment:		The product can contribute to enabling a wall, roof or other building element to satisfy the requirements of this Standard.

3 The Building Regulations (Northern Ireland) 2000

 In the opinion of the BBA, the Everdure Caltite System, if used in accordance with the provisions of this Certificate, can satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is an acceptable material. See section 13 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The product satisfies the requirements of these Regulations. See sections 8.2 and 12.7 to 12.9 of this Certificate.

4 Construction (Design and Management) Regulations 1994

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: *6 Delivery and site handling, and 14 Placing (14.4).*

Technical Specification

5 Description

5.1 The Everdure Caltite System comprises two components, Superplastet (either SR or F) and Everdure Caltite, and is used for producing waterproof and damp-proof concrete.

5.2 The Superplastet SR component is a liquid admixture⁽¹⁾ that significantly reduces the water/cement ratio of the mix while enhancing the workability of the concrete during placing.

(1) to BS 5075-3 : 1985

5.3 Superplastet F is used when a very low water/cement ratio is required for higher early strength concrete.

5.4 The Everdure Caltite component is an aqueous, hydrophobic liquid that provides waterproofing, pore-blocking and enhanced durability properties to concrete in which it is incorporated.

5.5 Both components are produced by a batch blending process. Quality control checks are carried out on the raw materials, during the production processes and on the final products.

6 Delivery and site handling

6.1 The products are delivered to site either in 180 litre or 205 litre drums or by bulk tanker. Drums are stencilled with the relevant product details and the batch number. A label containing the BBA identification mark incorporating the number of this Certificate is attached to the drum. A copy of each material's Safety Data Sheet accompanies the delivery.

6.2 The components are not flammable. They should be stored protected from frost.

6.3 The component items of the system are classified as non-hazardous, but Caltite has a pH value of 10 to 11 and may evolve ammonia. Overalls and gloves should be worn when handling the products and contact to the eyes should be avoided.

Design Data

7 General

7.1 Concrete containing the Everdure Caltite System can be designed for use in all normal concreting methods, including precast, pre-stressed, post-tensioned, ready-mixed, reinforced, slip formed and pumped concrete.

7.2 The system produces concrete with enhanced durability and improved protection against reinforcement corrosion by:

- minimising the water/cement ratio of the concrete mix resulting in the reduction of the capillary network of the cured concrete, and

- providing a physical pore-blocking action that protects resulting concrete against water ingress via absorption and hydrostatic pressure.


7.3 Compared to similar plain concrete, use of the system promotes:

reduced porosity
reduced permeability
increased water resistance
increased corrosion resistance.

7.4 These properties enable the concrete to be used in structures such as basements, roofs, swimming pools, tunnels, and culverts, without the requirement for additional applied protection. Where exposure to aggressive soil conditions or chemicals is anticipated, a full assessment of the site should be made. In these situations the Certificate holder should be consulted on the suitability of the product.

8 Construction

8.1 Structures built incorporating the system should be designed to the relevant sections of BS 8007 : 1987, BS 8102 : 1990, and BS 8110-1 : 1997.

 8.2 The Everdure Caltite System is suitable for Type B construction as described in BS 8102 : 1990, and it will be suitable for all grades defined in Table 1 of this Standard. For Grade 4 (where a vapour-proof structure is required), it will be necessary to provide an adequate section thickness (see section 12.9).

 8.3 Basements for dwellings should be designed in accordance with the guidance given in the Approved Document, *Basement for dwellings*.

9 Mix design

9.1 The system should be added to the concrete mix at the rate of:

Superplastet SR (or Superplastet F)	—	approximately 1% ⁽¹⁾ by weight of cement, litres per cubic metre
Everdure Caltite	—	30 litres per cubic metre of concrete

(1) May be varied between 0.8% and 1.5% by agreement with the Certificate holder.

9.2 The concrete must contain a minimum cement content of 350 kgm⁻³ and be batched to a slump of 50 mm to 150 mm when tested in accordance with BS EN 12350-2 : 2000. Further details of suitable mixes can be obtained from the Certificate holder or their approved representatives.

10 Fresh concrete properties

Workability

10.1 Concretes produced using the Everdure Caltite System will, if designed as described in section 8 of this Certificate, have a markedly increased workability compared with similar plain

concretes. Workability of the concrete is a function of the dosage rate of the Superplastet component and can be designed by variation of this component (within the limits of section 9.1 of this Certificate). The advice of the Certificate holder should be sought in particular cases.

Compatibility

10.2 Concretes containing the Everdure Caltite System are compatible with other hardened Portland cement concretes (including pulverized-fuel ash, ground granulated blastfurnace slag, or silica fume blends).

10.3 When adhesion to hardened concrete containing the product is required, a bonding agent is necessary. The Certificate holder should be contacted for details in particular cases.

10.4 Use of the products with an air-entraining agent should be only with the written agreement of the Certificate holder.

11 Setting and hardening properties

11.1 The setting and hardening characteristics of plain concretes incorporating the Everdure Caltite System can be designed in a similar manner to equivalent plain concretes with or without admixtures.

11.2 Concrete containing the system has a reduced tendency to bleed and segregate compared with plain concrete. Site evidence confirms a significant reduction in drying shrinkage (see Table 1).

12 Hardened concrete properties

General

12.1 The effects of the system on the properties of concrete are given in Table 1.

Property	Test reference	Control concrete	Everdure Caltite concrete
Water absorption (%)	BS 1881-5	3.1	0.8
Water permeability (ms ⁻¹)			
0–50 mm	Taywood/Valenta	2.23 x 10 ⁻¹²	1.14 x 10 ⁻¹²
50–100 mm		1.43 x 10 ⁻¹²	0.15 x 10 ⁻¹²
Drying shrinkage (%)	BS 1881-5	0.036	0.024
Wetting expansion (%)	BS 1881-5	0.020	0.007
Freeze/thaw expansion (%)	BS 5075-2	0.031	0.010
Initial surface absorption test (ISAT) (mlm ⁻² s ⁻¹)	BS 1881-5		
10 mins		0.50	0.11
30 mins		0.25	0.08
60 mins		0.16	0.04
120 mins		0.10	0.02

12.2 These properties can be designed in a similar manner to plain concretes (including pulverized-fuel ash, ground granulated blastfurnace slag, or silica fume blends) with or without admixtures.

12.3 Concretes containing Everdure Caltite have increased resistance to the passage of moisture and water vapour (and hence to any solutes) and will not require additional surface applied membranes or protection.

12.4 Treated concrete is subject to distinctly reduced drying shrinkage and cracking.


Resistance to leaching

12.5 The use of the system will reduce the leaching of lime from the hydrated cement in the concrete. Inspected sites and investigation of Everdure Caltite concrete up to 30 years old show no evidence of the active ingredients of the system within the concrete leaching out.

Potable water

12.6 The product used in concrete complies with BS 6920-1 : 1996 and is suitable for use in contact with potable water. It is listed in Section 2a of the Water Fittings and Materials Directory by the Water Regulations Advisory Scheme.

Water absorption

 12.7 Everdure Caltite concrete shows significantly reduced water absorption characteristics over high quality plain concrete (see Table 1). Consequently the Everdure Caltite concrete has increased resistance to frost, chloride and sulphate damage.

Water penetration

12.8 Portland cement concretes containing the product have significantly greater resistance to water penetration than equivalent plain concretes (see Table 1).

Water vapour permeability

12.9 Everdure Caltite concrete has significantly reduced permeability to water vapour than equivalent plain concretes. Moisture vapour resistance is a function of section thickness. The appropriate section thickness to satisfy the requirements for Grades 3 and 4 levels of protection of basements to BS 8102 : 1990, Table 1, is given in Table 2.

Grade	Usage	Approximate required vapour resistance (MNsg ⁻¹)	Section thickness (mm)
3	Habitable basement areas	200	100
4	Archives and stores requiring a controlled environment	550	280

Reinforcement protection

12.10 The high alkalinity (pH > 13) of concrete necessary to prevent corrosion of the reinforcement is maintained in Everdure Caltite concrete.

12.11 Corrosion of reinforcement is normally caused by the ingress of chloride to the steel or by the reduction in alkalinity of the concrete by the diffusion of carbon dioxide. These processes lead

to the breakdown of the steel's corrosion-protective passive layer. Everdure Caltite limits the ingress of deleterious agents into the concrete making the system effective in providing protection against corrosion. Data from aggressive sites indicate no significant decrease in corrosion protection over a 30-year period.

Carbonation resistance

12.12 Portland cement concretes containing the product have significantly greater resistance to carbonation than equivalent plain concretes.

Alkali silica reaction (ASR)

12.13 Petrographic analysis of concrete containing a known reactive aggregate showed no reaction in concrete containing the Everdure Caltite System when subject to wetting and drying cycling, while other data referring to similar reference concretes indicated ASR was occurring. Therefore it appears that Everdure Caltite may be beneficial in limiting ASR.

13 Durability



Everdure Caltite concrete is more durable than equivalent plain concrete. Data and site observations indicate no significant decrease in performance over a 30-year period.

Installation

14 Placing

14.1 All aspects of installation, including choice of plant, machinery and small-scale site batch mixing, must be carried out in accordance with the Certificate holder's instructions and this Certificate.

14.2 As with all concretes, Everdure Caltite concrete should be fully compacted.

14.3 Provided these instructions are followed, use of the Everdure Caltite System does not require significant deviation from conventional practices for concrete installation.

14.4 Installation should be in accordance with the Certificate holder's health and safety guidance and the normal routine precautions for handling Portland cements. Since ammonia may be evolved from fresh concrete containing the product, a breathing mask and goggles should be worn if placing in very confined or poorly ventilated areas.

15 Curing

The concrete should be cured strictly in accordance with BS 8110-1 : 1997 and in accordance with the Certificate holder's recommendations where site specific information exists.

16 Joints

16.1 Joints should be designed with waterstops as recommended in BS 8102 : 1990, to maintain watertightness of the whole structure. The advice of

the Certificate holder should be sought on particular applications.

16.2 Penetrations of the concrete, such as pipe entries or formwork ties, must also be securely sealed to maintain watertightness. The advice of the Certificate holder should be sought on suitable systems.

17 Finishes

If it is necessary to apply a coating to concrete containing Caltite, it should be noted that water-based products will be repelled. For specific cases the manufacturer can advise on suitable bonding agents.

Technical Investigations

The following is a summary of the technical investigations carried out on the Everdure Caltite System.

18 Tests

Tests were carried out by the BBA to determine: characterisation tests on the system components including specific gravities, differential thermal analysis and gas chromatography comparative workability of fresh concrete compressive strength of cured concrete, and slip resistance of cured concrete.

19 Other investigations

19.1 Data relating to the following aspects of the Everdure Caltite System concrete were examined and assessed:

- mix designs
- curing regime
- toxicity
- setting and hardening concrete characteristics (including setting time, bleeding, heat of reaction, curing and plastic shrinkage)
- hardened concrete characteristics (including density, colour, compressive strength, modulus of elasticity, drying shrinkage/wetting expansion, thermal shock resistance, tensile strength, porosity, pore distribution, bond strength to steel, permeability, resistance to carbonation, sulphate attack, chlorides, acid, freeze/thaw, water penetration and leaching, and water vapour permeability)
- requirements for surface finishes
- maintenance and repair requirements.

19.2 Visits were made to sites where installation of the system was taking place.

19.3 Visits were made to a number of sites where the product has been in service for some time.

19.4 Cementaid (UK) Limited's methods of technical support to clients were observed and assessed.

Bibliography

BS 1881 *Testing concrete*

BS 1881-5 : 1970 *Methods of testing hardened concrete for other than strength*

BS 5075 *Concrete admixtures*

BS 5075-2 : 1982 *Specification for air-entraining admixtures*

BS 5075-3 : 1985 *Specification for superplasticizing admixtures*

BS 6920 *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water*

BS 6920-1 : 1996 *Specification*

BS 8007 : 1987 *Code of practice for design of concrete structures for retaining aqueous liquids*

BS 8102 : 1990 *Code of practice for protection of structures against water from the ground*

BS 8110 *Structural use of concrete*

BS 8110-1 : 1997 *Code of practice for design and construction*

BS EN 12350 *Testing fresh concrete*

BS EN 12350-2 : 2000 *Slump Test*

Conditions of Certification

20 Conditions

20.1 This Certificate:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

20.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

20.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

20.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

20.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.



In the opinion of the British Board of Agrément, the Everdure Caltite System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 93/2888 is accordingly awarded to Cementaid (UK) Limited.

On behalf of the British Board of Agrément

Date of Fourth issue: 26th April 2001

A handwritten signature in black ink, appearing to read 'P. Q. Newson', is written over a light grey background.

Chief Executive

**Original Certificate issued 9th March 1993. This amended version includes an alternative Superplastet component, revised Building Regulations and new Conditions of Certification.*

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British Board of Agrément

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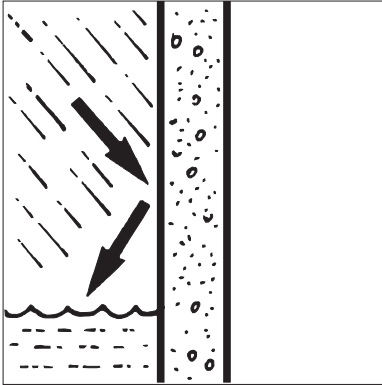
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**EVERDURE CALTITE SYSTEM
(BBA CERTIFICATE No 93/2888)
IRISH BUILDING REGULATIONS STATEMENT**



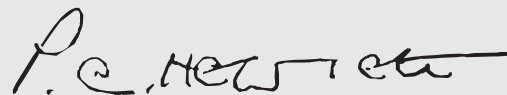
- THIS STATEMENT RELATES TO THE EVERDURE CALTITE SYSTEM AND SETS OUT THE OPINION OF THE BBA ON THE POSITION OF THE PRODUCT UNDER THE BUILDING REGULATIONS IN THE REPUBLIC OF IRELAND.
- It must be read in conjunction with BBA Certificate No 93/2888.
- It will remain valid provided BBA Certificate No 93/2888 is valid.

The Building Regulations 1997 Ireland (as amended)

In the opinion of the BBA, the Everdure Caltite System, if used in accordance with the provisions of Certificate No 93/2888, will satisfy or contribute to satisfying the relevant requirements.

Requirement:	C4	Resistance to weather and ground moisture
Comment:		The system, installed in accordance with BBA Certificate No 93/2888 meets this requirement. See sections 8.2, 8.3 and 12.7 to 12.9 of BBA Certificate No 93/2888.
Requirement:	D1	Materials and workmanship
Comment:		The products are proper materials. See section 13 of BBA Certificate No 93/2888.

On behalf of the British Board of Agrément



Date: 19th April 2002

Chief Executive